

# CRITICAL ITEMS LIST

ASSY NOMENCLATURE: WINCH ADAPTER

SYSTEM: 4.2

ASSY P/N: SED 33102348

SUBSYSTEM: 5.1

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| FMEA |     | NAME, QTY & DRAWING REF DESIGNATION             | CRITY | FAILURE MODE AND CAUSE   | FAILURE EFFECT ON END ITEM   | RATIONALE FOR ACCEPTANCE   |
|------|-----|---|-------|--|--|--|
| REF  | REV |   |       |  |  |  |
| 1A   |     | EVA WINCH ADAPTER ASSEMBLY, (1)<br>SED 33102348 | 2/1R  | <p>Mode:<br/>Unable to reel out rope</p> <p>Cause:<br/> <ul style="list-style-type: none"> <li>• Rope knots</li> <li>• Cam cleat contamination</li> <li>• Rope jams on spool</li> <li>• Spool sticks on axle</li> <li>• Material failure</li> </ul> </p> | <p>Unable to cradle RMS which prevents closing the payload bay doors</p> <p>Redundancy - RMS jettison system</p> | <p>1. Design Features to Minimize Failure Mode.</p> <ul style="list-style-type: none"> <li>a. Designed so that spool and axle are not loaded during use.</li> <li>b. Tolerances used on parts to minimize binding due to temperature extremes or contamination and to allow for dry film lubrication. Design also incorporates steel bushing with spring and Teflon washers to prevent sticking.</li> <li>c. Larger than required diameter Kevlar rope selected to minimize knotting and for ease in handling.</li> <li>d. Safety factor of 1.4</li> <li>e. Working load of 584 lbs.</li> </ul> <p>2. Test or Analysis to Detect Failure Mode.</p> <p><u>Acceptance</u></p> <ul style="list-style-type: none"> <li>a. Functional Test -- Complete functional testing to assure that all parts function properly.</li> </ul> <p><u>Certification</u></p> <ul style="list-style-type: none"> <li>a. Certification test consists of: deploy and reel in 5 feet of rope, confirm that the reel rotates freely and does not freewheel for more than one half turn, apply a 840 lbs load to the hook while the rope is engaged in cam cleats, and confirm that the assembly does not fail under load.</li> <li>b. Thermal qualification testing to certify this tool for the worst case PSA storage temperature environment of 250°F to + 350°F for 160 hours.</li> </ul> <p><u>Turnaround</u></p> <ul style="list-style-type: none"> <li>a. Complete functional testing will be performed once a year or after each mission use to assure that all parts function properly.</li> <li>b. Replace Kevlar rope after each mission use.</li> <li>c. Inspect Kevlar rope for fraying or other damage once a year.</li> </ul> |

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ATTACHMENT 1  
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PREPARED BY: P. J. Hooper

SECRET/NOFORN/DALL

APPROVED BY: F. O. Ross

DATE: 9/26/88

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# CRITICAL ITEMS LIST

ASSY NOMENCLATURE: WINCH ADAPTER

SYSTEM: 4 2

ASSY P/N: SED 33102348

SUBSYSTEM: 5 1

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| FMEA |     | NAME, QTY & DRAWING REF DESIGNATION                                | CITY | FAILURE MODE AND CAUSE  | FAILURE EFFECT ON END ITEM   | RATIONALE FOR ACCEPTANCE  |
|------|-----|--|------|---|--|---|
| REF  | REV |  |      |   |  |   |
| 1A   |     | EVA WINCH ADAPTER ASSEMBLY, (1)<br><br>SED 33102348<br>(Continued) | 2/1R | Mode:<br>Unable to reel out rope<br><br>Cause:<br>• Rope knots<br>• Cam cleat contamination<br>• Rope jams on spool<br>• Spool sticks on axle<br>• Material failure | Unable to cradle RMS which prevents closing the payload bay doors.<br><br>Redundant - RMS jettison system. | <p>3. Inspection.</p> <p><u>Manufacturing</u> (Completed)</p> <ul style="list-style-type: none"> <li>a. Verify as-built configuration.</li> <li>b. Accomplish NDE on piece parts prior to assembly.</li> <li>c. Verify certificate of compliance on materials.</li> <li>d. Verify cleanliness according to drawing requirements.</li> <li>e. Verify torque or spring tension on bushing and washers according to drawing requirements.</li> </ul> <p><u>Turnaround</u></p> <ul style="list-style-type: none"> <li>a. Verify rope is knot and tangle free.</li> <li>b. Inspect for visible damage, surface contamination, and clean according to PS2B/PA 05001.</li> <li>c. Verify completion of functional test for reacceptance.</li> </ul> <p>4. Failure History</p> <p>JSCE0344 - During the -200°F cold case test the Teflon rollers would not rotate and the hook latch would not close completely by itself and operated stiffly</p> <p>5. Operation Use.</p> <ul style="list-style-type: none"> <li>a. <u>Operational Effect of Failure</u> - If the rope cannot be removed from the reel by any means, the reel could not be used. Other tools would have to be used to cradle the RMS. This would increase the length of the EVA task.</li> <li>b. <u>Crew Action</u> - The PRD's, wrist tethers, and waist tethers would have to be used to form a replacement rope to secure to the RMS for cradling.</li> <li>c. <u>Crew Training</u> - This crew action will be incorporated into the EVA crew training flow.</li> <li>d. <u>Mission Constraints</u> - None identified.</li> <li>e. <u>In-flight Check(s)</u> - The crew will visually inspect the winch adapter as it is being used.</li> </ul> |

PREPARED BY: D. E. HARRIS

SUPPLEMENTING DATA

APPROVED BY: J. D. ROSS

DATE: 12/81

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